

Welcome to the **APRIL** edition of the WDFW Climate News Digest. Here you will find highlights of climate change news, events and resources for WDFW staff. Feedback or suggestions for items to include in future editions are much appreciated – thanks to those who have sent links and references and please keep them coming. We are particularly interested in projects or issues you may be involved in which have a climate change component. Many thanks!

WHAT'S HAPPENING AT WDFW?

Selected projects, agency resources and initiatives

Washington State Releases Report on Climate Change Impacts and Outlines a Response Strategy

From the news release: In recognition of Washington's vulnerability to climate change risks, the Washington Legislature and Gov. Chris Gregoire directed state agencies to develop an integrated climate change response strategy. The report, "Preparing for a Changing Climate: Washington State's Integrated Climate Change Response Strategy," was prepared by the Washington Department of Ecology (Ecology) in collaboration with the state departments of Agriculture, Commerce, Fish and Wildlife, Health, Natural Resources, and Transportation. The state agencies drew on the policy, management and scientific expertise of a broad range of stakeholders to develop the recommendations that are the basis of the report. The report outlines strategies for protecting human health, safeguarding infrastructure and transportation systems, improving water management, reducing losses to agriculture and forestry, protecting **sensitive and vulnerable species**, and supporting communities by involving the public.

"By taking action now, we have a better chance of protecting Washington's people, jobs, economy and natural resources from climate change risks, taking advantage of our unique position in the Pacific Northwest to increase our competitiveness and helping build resilient communities," Gov. Gregoire said. "It's good government and good business to consider climate impacts as part of our ongoing work. That's what this Response Strategy is about." If no action is taken, long-term costs of climate-related impacts are projected to reach nearly \$10 billion a year by 2020 from increased health costs, storm damage, coastal destruction, rising energy costs, increased wildfires, drought and other impacts. The report is available at: http://www.ecy.wa.gov/climatechange/ipa_responsestrategy.htm

*For questions on WDFW's involvement in this strategy or how it accounts for impacts on species, habitats and ecosystems, please be in touch with Lynn. For those of you wishing to explore on your own, Chapter Five focuses on Species and Ecosystems and chapters can be downloaded individually from the [website](#).

UPCOMING EVENTS - *please note different time zones in announcements!*

****TOMORROW**!**

April 18th WEBINAR -- "Conservation in a Rapidly Changing Climate: Problems, Pitfalls, and Proactive Management"

Wednesday, April 18, 1:00-2:30 PM Eastern

Dr. Camille Parmesan, Professor in Integrative Biology, University of Texas at Austin

**** Apologies for the short notice for this webinar! If you cannot attend, the presentation will be posted in approximately 1-2 weeks at the following site:**

http://training.fws.gov/CSP/Resources/climate_change/safeguarding_bc.html

Description: This talk will provide both an overview of the impacts of climate change and how we can use observed changes (e.g. range shifts) to inform us about conservation implications and point to possible management interventions. New climate models make it easier to explore different possible future scenarios for how the ranges of wild species might shift, contract or expand, but full utilization of these models requires intensive species' location data, with obvious implications for monitoring needs. There is increasing evidence that the impacts of climate change vary widely depending on other anthropogenic stressors. Interactions between climate change and other factors cause difficulties in teasing out their individual effects, but may also provide an opportunity for proactive adaptation to future changed climates.

YOU MUST REGISTER TO JOIN THIS WEBINAR:

To register, go to:

<https://doilearn.webex.com/doilearn/k2/j.php?ED=137864847&UID=1129262537&HMAC=baa2045f2f160961927a82de5d33fbfe1ca74c9d&RT=MiMxMQ%3D%3D&FM=1>

Once submitted, your name will be added to the registry for the webinar and you will receive an email with instructions on how to join the webinar via WebEx platform. If you have any questions regarding the Safeguarding webinars, please contact:

Ashley Fortune: 304.876.7361or Ashley_Fortune@fws.gov

April 24 WEBINAR: Modeling Sea Level Rise Impacts on Storm Surges Along the Pacific

Northwest Coast, Dr. Claudia Tebaldi, Climate Central

Tuesday, April 24th: 10-11 AM PST Hosted by "C3" -- *The Pacific Northwest Climate Change Collaboration (C3)* <www.c3.gov> is a federal inter-agency group of climate change scientists, coordinators, science center directors and staff

Sound policies for protecting coastal communities, assets and fish and wildlife resources require good information about vulnerability to flooding. Claudia Tebaldi and colleagues investigated the influence of sea level rise on expected storm surge-driven water levels and their frequencies along the contiguous United States. [This work was recently published](#) and [announced by Climate Central](#) (along with other findings) and also received considerable [media attention](#).

Claudia will explain the main drivers of local sea level rise, historic sea level in the Pacific Northwest, and results and findings from the recent modeling effort. The authors found that substantial changes in the frequency of what are now considered extreme water levels may occur even at locations with relatively slow local sea level rise. They estimate that, by mid-century, some locations in the Pacific Northwest may experience high water levels annually that would qualify today as 'century' extremes (i.e., having a chance of occurrence of 1% annually). Some sites will see century levels become 'decadal' (having a chance of 10% annually), and some will see substantially higher frequency of previously rare storm-driven water heights in the future.

Conference Call Information: Please activate your mute control when not speaking.

Dial-in Number: 888-233-5043 Passcode: 72410#

For the video, use the following WebEx link and information:

<https://mmancusa.webex.com/mmancusa/j.php?ED=180508967&UID=494717212&PW=NNDUzMjY0Y2U5&RT=MiMO>

May 9th Webinar: Demonstration of Uncertainty Analysis using the Sea Level Affecting Marshes Model (SLAMM) by Marco Propato and Jonathan Clough

Space is limited. Reserve your Webinar seat now at:

<https://www1.gotomeeting.com/register/603814280>

Predictive models are always affected by uncertainties. There is not one “right” prediction, rather there is a distribution of possible future results. The recent integration of a stochastic uncertainty analysis module to the Sea Level Affecting Marshes Model (SLAMM) allows users to examine wetland coverage results as distributions and can improve the decision making process. This addition to the SLAMM interface makes it possible to examine the effects of uncertainty and data errors in model parameters, including sea level rise, uplift/subsidence, tide ranges, and accretion and erosion rates, as well as feedbacks between sea level rise and accretion. A stand-alone program, the SLAMM Uncertainty Viewer, was developed with funding from Ducks Unlimited in order to simplify uncertainty output for end users, analysts, and decision makers. The SLAMM Uncertainty Viewer provides a map-based interface that analyzes future wetland-coverage probabilities for a user-defined region. Graphical outputs from the viewer provide quantitative results that can assist in planning and decision-making. Learn more about SLAMM at <http://warrenpinnacle.com/prof/SLAMM>.

Title: *Demonstration of Uncertainty Analysis using the Sea Level Affecting Marshes Model (SLAMM)* by Marco Propato and Jonathan Clough

Date: Wednesday, May 9, 2012, **Time:** 1:00 PM - 2:00 PM **EDT**

After registering you will receive a confirmation email containing information about joining the Webinar.

May 22nd WEBINAR: Changes in Winter Precipitation Extremes for the Western U.S., Dr. Francina Dominguez, University of Arizona

10:00-11:00 a.m. PST

Hosted by “C3” -- The Pacific Northwest Climate Change Collaboration (C3) <www.c3.gov> is a federal inter-agency group of climate change scientists, coordinators, science center directors and staff. Dr. Dominguez and colleagues [recently published findings](#) showing consistent and statistically significant increases in the intensity of future extreme winter precipitation events over the western United States, as simulated by an ensemble of regional climate models (RCMs). All eight simulations analyzed in this work consistently show an increase in the intensity of extreme winter precipitation with the multi-model mean projecting an area-averaged 12.6% increase in 20-year return period and 14.4% increase in 50-year return period daily precipitation.

Conference Call Information: Dial-in Number: 877-952-8012 Passcode: 520083#

For the video, use the following WebEx link and information:

<https://mmancusa.webex.com/mmancusa/j.php?ED=180508857&UID=494717212&PW=NYmJhYjdjOWQ3&RT=MiMO>

SAVE THE DATE October 1-2, 2012 – [3rd Annual Pacific Northwest Climate Science Conference](#), Boise Idaho.

The Program Committee for the Pacific Northwest Climate Science Conference is pleased to announce that the 3rd annual meeting will be held at the Boise Centre in Boise, Idaho on 1 - 2 October 2012. This conference provides an annual forum to exchange scientific results and policy and management options related to climate change and climate impacts research focused on the Pacific Northwest. The conference attracts a wide range of interested participants, including policymakers, resource managers, public agency staff, NGO personnel, and agency and university scientists. For more information, please visit the conference web site at <http://pnwclimateconference.org>. The committee is currently

accepting proposals for Special Sessions; future announcements in June will provide information about the Call for Abstracts for the conference, plus details on registration for the meeting.

For presentations from last year's conference, please visit:

<http://cses.washington.edu/cig/outreach/pnwscienceconf2011/agenda.php>

NEWS AND RESOURCES

Glacier Erasure, South Cascades Glacier, USGS

<http://wa.water.usgs.gov/projects/glacier/video.html>

This video is an animation of aerial photos of South Cascade Glacier in northwestern Washington State from the 1950s to present. South Cascade Glacier is one of three benchmark glaciers studied by the USGS for the effects of changes in climate. The mass-balance scientific record for South Cascade Glacier is the longest of its kind in North America and is used by climate scientists worldwide.

U.S. Department of Agriculture's climate zone guide show northward warming trends

A new government map gives gardeners in many parts of the nation a chance to turn over a new leaf for the first time in decades. Long-awaited changes unveiled Wednesday in the U.S. Department of Agriculture's climate zone guide show northward warming trends, while also targeting a few colder areas in the mountains. The "hardiness" guide, last updated in 1990, lists average minimum temperatures for different latitudinal zones. Each zone is based on 10 degrees Fahrenheit. Two new zones were added in hotter climates this year for a total of 13 zones. Zone 1 is coldest (-60 to -50). Zone 13 is hottest (60 to 70) and is found only on Hawaii and [Puerto Rico](#). The new map, located on the [USDA](#) website, uses 30 years of weather data gathered from 1976 to 2005 and is more precise than the 1990 version, showing smaller areas and accounting for higher elevations and bodies of water that can influence temperature. It was designed for the Web, allowing people to enter their ZIP code and see their zone down to half-mile segments.

MORE: [USDA Plant Hardiness Zone Map](#)

Series of Free Weekly Webinars on Resources Available for Teaching Climate Change Science to be Held through May 22, 2012

Organized by the National Council for Science and the Environment, Council of Environmental Deans and Directors, and the American Indian Higher Education Consortium, this free weekly webinar series will provide an introduction to a variety of resources available for teaching about climate change science and solutions that are located on the CAMEL (Climate Adaptation and Mitigation E-learning) web portal. Each webinar will feature a faculty member discussing a teaching module or exercise and how to use it in your teaching. The modules to be discussed are designed for undergraduate students, primarily at an introductory level. All webinars will be archived and posted on the CAMEL portal. See the [CAMEL website](#) for more information

CLIMATE SCIENCE

Intergovernmental Panel on Climate Change Releases Special Report on Extreme Events and Climate Change

On March 28, 2012, the United Nations Intergovernmental Panel on Climate Change (IPCC) released its

Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX). The report states that climate change has led to changes in climate extremes such as heat waves, record high temperatures, and heavy precipitation in the past 50 years. The report is the outcome of cross-disciplinary teamwork between scientists studying the physical aspects of climate change, scientists with expertise in impacts, adaptation and vulnerability as well as experts in disaster risk management. The report is available at: <http://www.ipcc-wg2.gov/SREX/>.
http://www.ipcc.ch/news_and_events/docs/srex/srex_press_release.pdf

New York Times article highlights earlier onset of spring

http://www.nytimes.com/2012/03/20/opinion/spring-gets-ahead-of-itself.html?_r=1&ref=globalwarming#

Over the past several decades spring weather has been arriving earlier in most parts of the United States. The USA National Phenology Network has developed an index that can be used to estimate the date of the onset of the spring growing season (as opposed to the date in March when daylight and darkness are of equal length, the technical definition of the first day of spring). This “first leaf” index estimates the first day that leaves appear on plants. Here in the lower 48, spring now arrives approximately three days earlier. The trouble lies in the fact that these timing changes create mismatches in how species interact. For example, the Stanford biologist Carol Boggs tells the story of the wildflower and the butterfly. Dr. Boggs has been tracking wildflowers and their pollinators for 40 years in the Colorado Rockies. The Mormon Fritillary butterfly (*Speyeria mormonia*) is a montane species that depends on the nectar of the Aspen Fleabane (*Erigeron speciosus*) — an alpine wildflower. U.S. researchers say early snowmelt in the Colorado Rocky Mountains may be causing a decline in populations of the Mormon Fritillary butterfly because the advanced melting is triggering a decline in the insect’s preferred flower species. For more on the this story:
http://www.nsf.gov/news/news_summ.jsp?cntn_id=123520

Climate Change, Increasing Temperatures Alter Bird Migration Patterns

Birds in eastern North America are picking up the pace along their yearly migratory paths. The reason, according to University of North Carolina at Chapel Hill researchers, is rising temperatures due to climate change. Using migration information collected in eBird, a citizen science program database containing 10 years' worth of observations from amateur birdwatchers, assistant professor of biology Allen Hurlbert, Ph.D., and his team in the UNC College of Arts and Sciences analyzed when 18 different species of birds arrived at various points across their migration journeys. Since 2002, eBird has collected more than 48 million bird observations from roughly 35,000 contributors.
<http://www.sciencedaily.com/releases/2012/02/120223142642.htm>

POLICY AND MANAGEMENT

Latest Forbes Issue highlights risks from Climate Change – cites Washington’s preparedness

The new issue of Forbes, the financial journal, highlights risk of climate change on water supply and national security. The article also includes a survey which ranks states in terms of climate action; Washington is listed among the top tier. Excerpt: “Climate change is changing precipitation patterns and intensity, increasing the incidence of droughts, floods, and erosion. These changes are making water supply and quality more difficult to obtain, affecting runoff and soil moisture, increasing water temperatures, decreasing snowpack and lake and river ice, threatening fish and aquatic species, and allowing saltwater intrusion and sea level rise. These changes are difficult to plan for, as past water patterns can no longer be used to predict the future. That uncertainty is problematic for businesses and

can cause political strife, but some states and regions are taking proactive steps to avoid water trouble and will therefore be more reliable places to do business ... Washington is among the best states when it comes to planning for climate change, but implementation will be crucial."

<http://www.forbes.com/sites/ericagies/2012/04/10/water-risk-threatens-businesses-national-security/>

Washington Shellfish Initiative Blue Ribbon Panel will address ocean acidification

In December 2011, Washington became the first state in the nation to have the Governor endorse an agreement among federal and state government, tribes, and the shellfish industry to respond and expand Washington's shellfish resources. As a part of the Washington Shellfish Initiative, and with strong support from the NOAA Administrator and scientists, Governor Gregoire has convened a Blue Ribbon Panel of leading tribal, state, federal and local policy makers; scientific experts; public opinion leaders; and industry representatives. The Blue Ribbon Panel will focus on documenting the current state of scientific knowledge, ways to advance our scientific understanding of the effects of ocean acidification, and recommend actions to respond to increasing ocean acidification, reduce harmful effects on Washington's shellfish and other marine resources, and adapt to the impacts of acidified waters.

<http://www.ecy.wa.gov/water/marine/oceanacidification.html>

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